

Please add the following claims.

25. A purified recombinant glycopolyptide of 65kd to 100kd that comprises approximately 40% to 60% carbohydrate by weight and that can bind human spermatozoa at least 10 times as strong as an equivalent molar amount of mouse ZP3.

26. The glycopolyptide according to claim 25, wherein the glycopolyptide is expressed by a human ovarian cell line.

27. A purified recombinant glycopolyptide having between 41 and 400 amino acids and having an active portion that can bind human spermatozoa at least 10 times as strong as an equivalent molar amount of mouse ZP3, wherein the active portion comprises an amino acid sequence that is more than 54% homologous with SEQ ID NO: 1 and has a predicted O-glycosylation site at a serine that corresponds to position 344 of the human ZP3 sequence.

28. A glycopolyptide according to claim 27, comprising a sequence from position 310 to position 345 of SEQ ID NO: 1 wherein at least one amino acid at a position selected from the group consisting of: (a)310; (b)320; (c)323; (d)326; (e)328; (f)329; (g)332; (h)334; (i)335; (j)337; (k)339; (l)341; (m)342 and (n)345 are substituted with (a)tyr; (b)asp; (c)gln; (d)asn, glu, gln, ile, pro, phe or cys; (e)ala or ile; (f)ser; (g)lys; (h)lys; (l)lys; (j)met; (k)ile or met; (l)thr; (m)asn; and (n)lys respectively.

29. The glycopolyptide according to claim 27, wherein the amino acid sequence of the active portion is more than 75% identical with SEQ ID NO:1.

30. The glycopolyptide according to claim 28, having between 41 and 300 amino acids.

31. The glycopolyptide according to claim 28, having between 41 and 200 amino acids.

32. The glycopolypeptide according to claim 28, having between 41 and 100 amino acids.

33. The glycopolypeptide according to claim 28, having between 41 and 65 amino acids.

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34. A purified recombinant glycopolypeptide of 65kd to 100kd that comprises 40% to 60% carbohydrate by weight and that can bind human spermatozoa at least 10 times as strong as an equivalent molar amount of mouse ZP3, wherein the glycopolypeptide is obtainable by a process comprising the steps of: )

- (a) transducing a cell from a human ovarian cell line with a polynucleotide that encodes a polypeptide comprising a sequence that is more than 54% homologous with SEQ ID NO:1;
- (b) establishing a stable-transfected cell culture for producing the glycopolypeptide; and
- (c) isolating the glycopolypeptide from the cell culture.

35. The purified glycopolypeptide of claim 34 wherein the ovarian cell line of step (a) is selected from the group consisting of PA-1, EB2, CaoV-3, CaoV-4, OVCAR-3, SK-OV-3, and SW 626.

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36. The purified glycopolypeptide of claim 34, wherein the polynucleotide of step (a) encodes a polypeptide comprising a sequence from position 310 to position 345 of SEQ ID NO: 1 wherein any one or more of amino acids at positions 310; 320; 323; 326; 328; 329; 332; 334; 335; 337; 339; 341; 342 and 345 optionally are substituted with tyr; asp; gln; asn, glu, gln, ile, pro, phe, cys; ala, ile; ser; lys; lys; lys; met; iso, met; thr; asn; and lys respectively.

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37. A purified glycopolypeptide that comprises carbohydrate and that can bind human spermatozoa at least 10 times as strong as an equivalent molar amount of mouse ZP3, wherein the amino acid sequence of the glycopolypeptide comprises a sequence from

position 310 to position 345 of SEQ ID NO: 1 and wherein any one or more of amino acids at positions 310; 320; 323; 326; 328; 329; 332; 334; 335; 337; 339; 341; 342 and 345 optionally are substituted with tyr; asp; gln; asn, glu, gln, ile, pro, phe, cys; ala, ile; ser; lys; lys; lys; met; iso, met; thr; asn; and lys respectively.

38. A glycopolypeptide that can bind human spermatozoa at least 10 times as strong as an equivalent molar amount of mouse ZP3 wherein the polypeptide portion of the glycopolypeptide is smaller than 25kd and includes a core region having a sequence shown in SEQ ID NO: 1 wherein one or more amino acids optionally are substituted at positions 310; 320; 323; 326; 328; 329; 332; 334; 335; 337; 339; 341; 342 and 345 with tyr; asp; gln; asn, glu, gln, ile, pro, phe, cys; ala, ile; ser; lys; lys; lys; met; iso, met; thr; asn; and lys respectively.

39. The glycopolypeptide of claim 38, having the sequence of SEQ ID NO: 1.

40. A glycopolypeptide having a polypeptide portion that is smaller than 10kd and which can bind human spermatozoa with greater affinity than mouse spermatozoa, wherein the glycoprotein has a sequence comprising sequence position numbers 337 to 348 of SEQ ID NO:1.

41. The glycopolypeptide of claim 40, wherein one or more amino acids at positions 337; 339; 341; 342 and 343 are substituted with met; iso, met; thr; asn; and lys respectively.

42. A purified recombinant glycopolypeptide of 65kd to 100kd that comprises approximately 40% to 60% carbohydrate by weight and that can stimulate the acrosome reaction of human spermatozoa when co-present with the spermatozoa at a concentration of less than 1 ug/ml for a time period of less than one hour.

43. The glycopolypeptide according to claim 42, wherein the glycopolypeptide is expressed by a human ovarian cell line.